

August 1978

D78-10172

# NASA TECH BRIEF

## *Lyndon B. Johnson Space Center*



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### Trimetric Scale for Drafting Machines

A trimetric scale for use with drafting machines allows three separate scales to be drawn with a single setting. The scale as shown in Figure 1 includes three foreshortened scales for  $15^\circ$  and  $30^\circ$  projections. Each scale is designed to measure along one axis. With this arrangement, there is no need to reset a drafting machine for any particular projection. The three basic

projections can be drawn from a single scale zero setting on the machine. The particular projections on the scale are defined on a cube shown in the triangular area. Ellipse proportions are also included for convenience.

Axonometric projections also can be determined using a table based on the model shown in Figure 2.

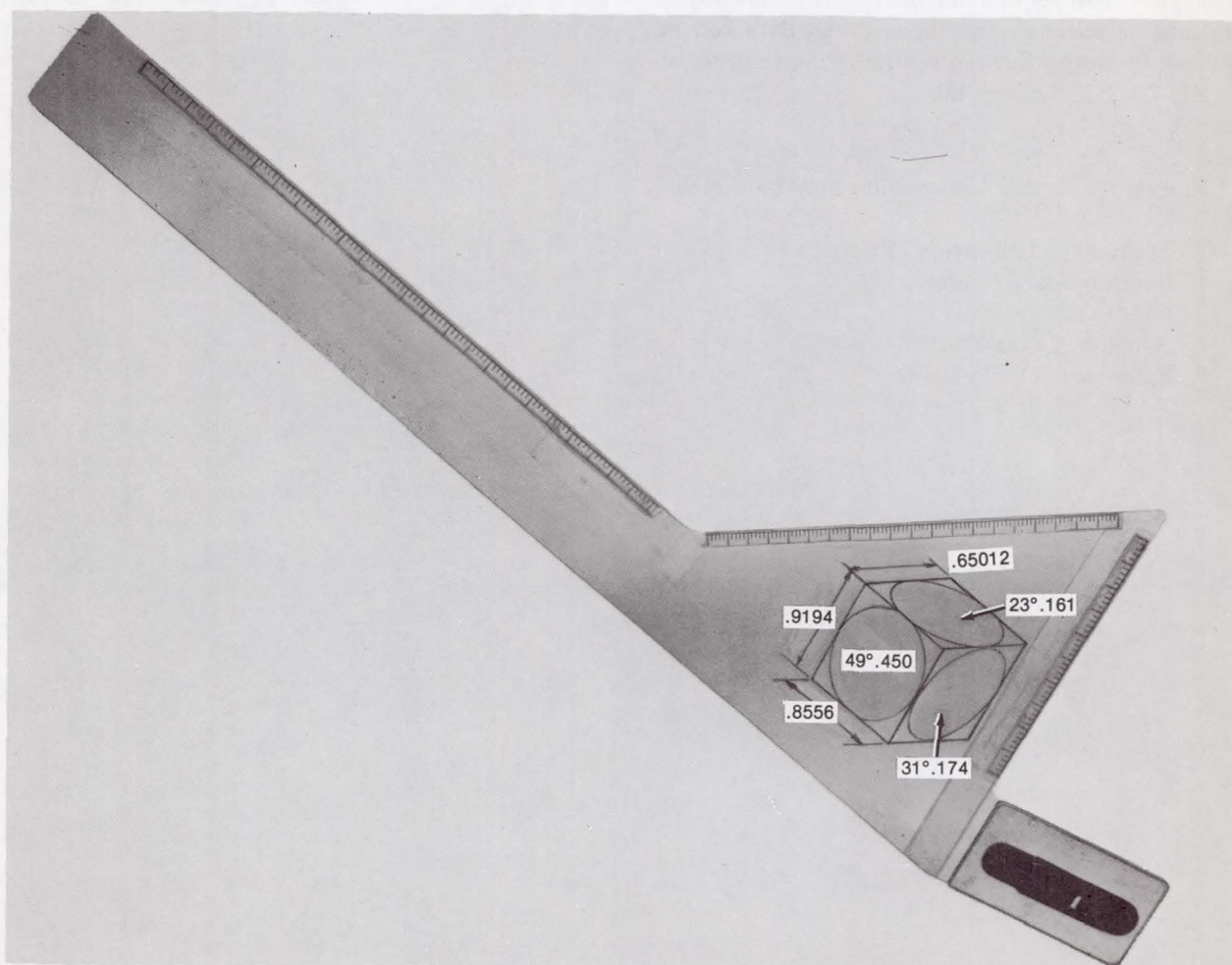


Figure 1. Trimetric Scale

(continued overleaf)

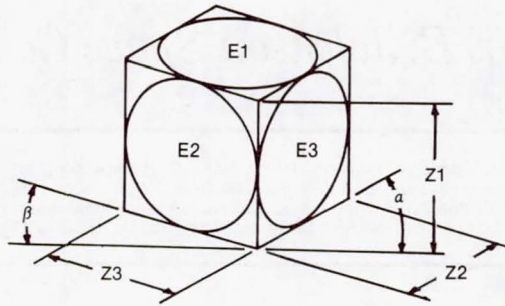


Figure 2. Axonometric Cube  
(Z Times True Dimension = Foreshortened Dimension)

The table is computed in  $1^\circ$  increments for the foreshortening scale factors and for the projected ellipse, given in degrees, required in a selected axonometric projection. This eliminates the necessity of a graphical development to determine the proper scale factors and ellipse sizes. Any set of axonometric projection angles may now be selected, and the required data can be obtained by simply looking up the values to generate Z1, Z2, Z3, E1, E2, and E3.

**Note:**

Requests for further information may be directed to:

Technology Utilization Officer  
Johnson Space Center  
Code AT3  
Houston, Texas 77058  
Reference: TSP75-10172

**Patent status:**

NASA has decided not to apply for a patent.

Source: J. C. Ryan and R. Chu of  
Rockwell International Corp.  
(MSC-19391 and MSC-15829)